

as opposed to socket-like surface contact in a ball bearing cage; a radial and circumferential movement of a ball with respect to the cage window as the CV joint articulates. Therefore, the multi-roller ball or the cage with the web grooves are not subcombinations that can be applied to a combination other than a CV joint. Therefore, the multi-roller ball and/or the cage with web grooves do not have utility by themselves or in other combinations (MPEP § 806.05(c)).

- f. Even if we consider for argument's sake that a CV joint (A) with the multi-roller balls (B₁) and the cage with web grooves (B₂) is a combination (AB), the MPEP § 806.05(b) states that restriction is ordinarily not proper between an old combination (AB) and the novel subcombination (B).
- g. The beginning sentence of the original claims ("A multi-roller ball assembly for any ball type constant velocity joint ...") has been modified in the amended claims as "A constant velocity joint comprising: ..." mainly to follow the standards set forth in the similar patents listed in the section 2 of this document. The amendment does not change the nature or scope of the invention at all.

CV Joint Patents that modify a single part

2. This section lists the examples of constant velocity joint inventions that focus on a member, yet the claims begin with "A universal joint comprising ...":

- a. Mazzotti, US 4,541,819 "Universal joint employing bearing rollers"
This invention is about a ball-like roller for any type of constant velocity joint.
Claim: A universal joint comprising ...

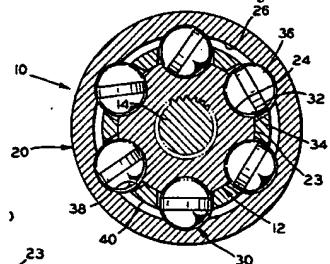
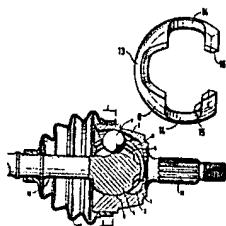


FIG. 2 (each ball having a cylindrical center portion whose diameter matches the cage width)

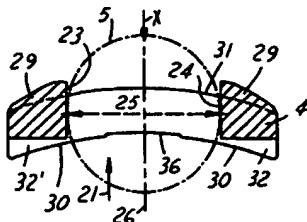
- b. Krude, US 4,185,476 "Constant velocity universal joint"
This invention is about a cage for any type of constant velocity joint.
Claim: A constant velocity universal joint comprising ...



c. Jacob, US 6,270,419 "Constant velocity fixed joint with two sets of running grooves extending in opposite directions"

This invention is about a cage for any type of constant velocity joint.

Claim: Constant velocity fixed joint comprising: ...

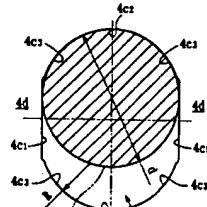


(a cage with raised flat surface)

d. Nakagawa, et al. (NTN), US 6,506,122 "Constant velocity universal joint"

This invention is about a cage for any type of constant velocity joint.

Claim: A constant velocity universal joint comprising: ...

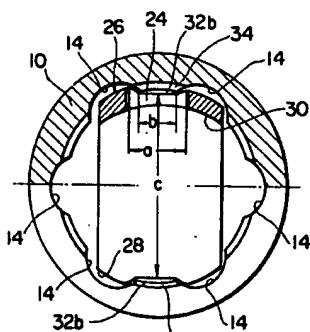


(cage circumferential surfaces with optimal radius of curvature)

e. Takahashi, et al., US 4,090,375 "Constant velocity universal joint"

This invention is about a cage for any type of constant velocity joint.

Claim: A constant velocity universal joint comprising: ...



(The cage is provided with transverse notches)

f. Girguis, US 4,325,232 "Constant velocity universal joint"
This invention is about a cage for any type of constant velocity joint.
Claim: Constant velocity universal joint, comprising ...

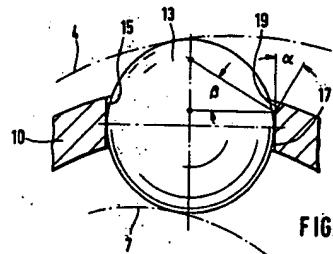
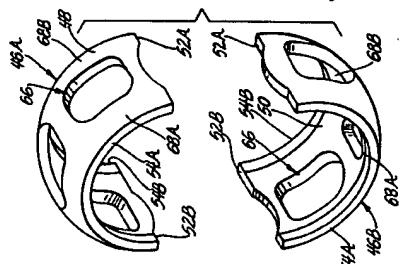


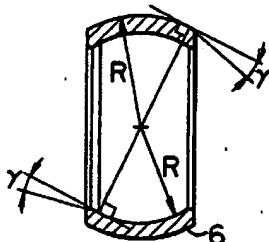
FIG. 7
(The cage has a beveled face)

g. Thomas, US 6,206,785 "Constant velocity universal joint and method"
This invention is about a cage for any type of constant velocity joint.
Claim: A constant velocity universal joint, comprising: ...

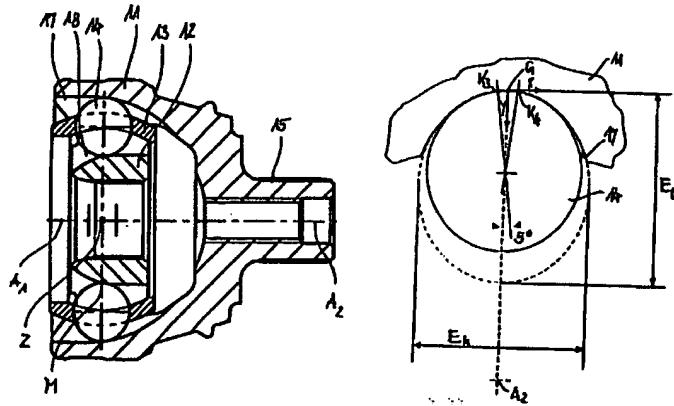


(two piece cage)

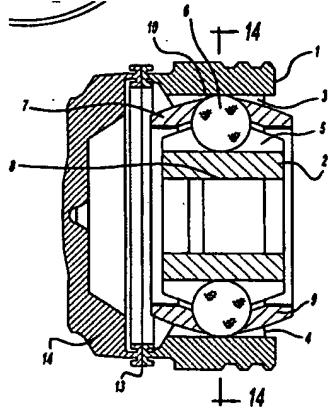
h. Yamamoto, US 4,358,282 "Constant velocity ball joint"
This invention is about a cage (having chamfered axial ends) for any type of constant velocity joint.
Claim: A constant velocity ball joint comprising: ...



i. Hildebrandt, et al. (GKN), US 6,705,947 "Constant velocity ball-and-grove joint"
This invention is about a ball track profile any type of constant velocity joint.
Claim: A constant velocity universal ball joint comprising: ...



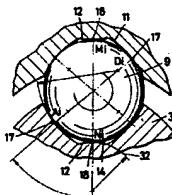
j. Wang, et al. (GKN), US 6,736,729 "Constant velocity joint and method of making same"
This invention is about the balls and tracks with textured surfaces.
Claim: A constant velocity ball joint, comprising: ...



k. Krude (Lohr & Bromkamp GmbH), US 4,019,347 "Ball grooves for a constant velocity universal joint"

This invention is about a ball-track profile for any type of constant velocity joint.

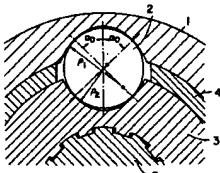
Claims: A constant velocity universal joint comprising ...



1. Kako, et al. (Toyota), US 4,305,263 "Constant velocity universal joint"

This invention is about a ball-track profile for any type of constant velocity joint.

Claims: A constant velocity universal joint comprising: ...



m. Ito, et al., US 4,319,465 "Constant velocity joint"

This invention is about a ball-track profile for any type of constant velocity joint.

Claims: A constant velocity joint comprising ...

